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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/722,929	11/26/2003	Joseph P. Rynd	25226A	1182
22889	7590	06/08/2006	EXAMINER	
OWENS CORNING 2790 COLUMBUS ROAD GRANVILLE, OH 43023			WOLLSCHLAGER, JEFFREY MICHAEL	
			ART UNIT	PAPER NUMBER

1732

DATE MAILED: 06/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/722,929

Applicant(s)

RYND ET AL.

Examiner

Jeff Wollschlager

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 and 21-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 21-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

The amendment to claims 1, 9, 14, 21, and 24 filed April 25, 2006 has been accepted. Claims 17-20 are canceled. Claims 1-16 and 21-24 are pending.

Claim Objections

Claim 24 is objected to because of the following informalities: The word "intercalated" is spelled incorrectly in the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The amendments to independent claims 1 and 21 are intended to limit the method to producing foam with a monomodal cell size distribution. This amendment to the claims is not supported by the original disclosure. To the contrary, the original disclosure does nothing to limit the method to a monomodal cell size distribution

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(original claim 17, for example). Further, the recitation of the key cell morphology parameters for producing the instant foam neither states nor suggests a monomodal or bimodal cell size distribution (Detailed Description, paragraph [0019]) as being critical parameters for the instant application. Additionally, the one reference to bi-modal cell morphology in the disclosure pointing to the prior art (Background of the Invention, paragraph [0007]) neither states nor suggests that the current method disqualifies a bimodal cell size distribution. It is unclear to the examiner how the locations in the disclosure referenced in the Remarks filed April 25, 2006 (paragraphs [0010 and 0020, Figures 4 and 5] support the amendments to limit the claims to a monomodal cell size distribution.

This rejection may be overcome by providing the column and line number(s) in the original disclosure, with adequate supporting remarks as needed, where the examiner may find support for the currently amended claims.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 21-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Chung et al. (U.S. Patent 4,394,460; issued July 19, 1983).

Regarding claim 1, Chung et al. teach a method of manufacturing a foam comprising: incorporating nano-particles of calcium carbonate, incorporating a blowing agent into the melt under a first pressure and a first temperature, extruding the polymer melt under a second pressure and temperature to allow the polymer melt to expand and foam, and cooling the foamed product to produce a monomodal foam with a cell size of less than 100 microns, which is greater than 60 microns. (col. 4, lines 18-35; col. 5, line 40-col. 6 line 6; Example 1).

Regarding claim 21, Chung et al. teach a method of manufacturing a foam comprising: incorporating nano-particles of precipitated calcium carbonate, an acicular nano-particle, incorporating a blowing agent into the melt under a first pressure and a first temperature, extruding the polymer melt under a second pressure and temperature to allow the polymer melt to expand and foam, and cooling the foamed product to produce a monomodal foam (col. 4, lines 18-35; col. 5, line 40-col. 6 line 6; Example 1).

As to claim 22, Chung et al. teach the calcium carbonate and other materials function as nucleating agents (col. 4, lines 9-35).

As to claim 23, the foam produced by Chung et al. meets the limitations of the method taught in claim 21. As such, the material produced by Chung et al. will be the same as the material produced by the instant claim.

Regarding claim 24, Chung et al. teach a method of manufacturing a foam comprising: incorporating nano-particles of precipitated calcium carbonate, incorporating a blowing agent into the melt under a first pressure and a first temperature, extruding the polymer melt under a second pressure and temperature to

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allow the polymer melt to expand and foam, and cooling the foamed product to produce a monomodal foam with a cell size of less than 100 microns (col. 4, lines 18-35; col. 5, line 40-col. 6 line 6; Example 1).

Claim 24 is rejected under 35 U.S.C. 102(b) as being anticipated by Hayashi et al. (European Patent Application EP 1,024,163; published April 23, 1999).

Regarding claim 24, Hayashi et al. teach a method of manufacturing a foam by incorporating nano-particles into a polymer melt, incorporating a blowing agent into the melt, extruding the polymer melt, and cooling the foamed product. Hayashi et al. teach incorporating nano-particles of calcium carbonate (paragraph [0065]) to produce foam with an average cell size of 200 to 1000 micrometers (paragraphs [0065 and 0067-0069]).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grinshpun et al. (WO 2001/39954; published June 7, 2001) in view of Lee et al. (U.S. Patent 6,759,446; filed May 2, 2002) or Nitzsche (U.S. Patent 6,617,295; issued September 9, 2003).

Regarding claim 1, Grinshpun et al. teach a method of manufacturing a rigid foam (Figure 6; page 10, lines 5-30) comprising: incorporating nano-particle fillers, calcium carbonate, or clays into a polymer (page 19 line 38-page 20 line 5), incorporating a blowing agent into the melt under a first pressure and a first temperature (page 20, lines 7-30), extruding the polymer melt under a second pressure and temperature to allow the polymer melt to expand and foam, and cooling the foamed product (page 21, lines 9-30), to produce a foam with a cell size ranging from 25 to 7000 micrometers (page 23, lines 11-15). Grinshpun does not explicitly teach that the nano-particles/nano-fillers employed are nano-clays, intercalated or expanded graphite, nor does Grinshpun disclose the particle size of the calcium carbonate. However, Lee et al. (hereinafter Lee) teach an analogous method of producing a rigid foam product where nano-clays are utilized (col. 1, lines 41-59). Additionally, Nitzsche teaches the use of calcium carbonate and nano-clays in the utilization of an analogous foaming resin (col. 3, line 64 – col. 4, line 7; col. 4, line 66-col. 5, line 9).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to take the method of Grinshpun for forming a rigid foam with calcium carbonate or clay additives and modifying it with the nano-clay additives taught by Lee or Nitzsche. One of ordinary skill would be motivated to do so, as taught by Lee, for the purpose of improving the physical properties of the foam (col. 1, line 41 – col. 2, line 22). Additional motivation is provided by Nitzsche who teaches that the particle size of nucleating agents impacts the cell structure (col. 2, lines 47-49) and that the foaming resin taught by his invention provides substantial cost savings (col. 2, lines 13-15). Therefore, the claimed invention as a whole is rendered *prima facie* obvious over the combined teaching of the prior art.

As to claims 2-4, Grinshpun teaches blends primarily consisting of polystyrene (page 14, line 41-page 15 line 4; page 24).

As to claims 5 and 6, Grinshpun teaches various blowing agents may be employed (page 18, lines 6-30).

As to claims 7, 8, and 16, Grinshpun teaches incorporating additives into the polymer melt such as nucleation agents, fillers and pigments (page 17, lines 12-20; page 19, line 38 - page 20, line 30).

As to claims 9-13, Lee et al. teach a method of manufacturing a rigid foam according to the method of claim 2, wherein the nano-particles are nano-Montmorillonite intercalated with polystyrene nano-clays used in the range of 0.5 – 5%, based on polymer weight (col. 1 lines 50 – 66 and col. 2 lines 43-50). Additionally, Nitzsche teaches the preferred use of montmorillonites for the foaming resin (col. 5, lines 6-9).

As to claims 14 and 15, Grinshpun teaches the foam has a density of 8 to 640 kg/m³ (page 13, lines 4-22; page 24, lines 25-37) and that the cell size is between 25 and 7000 micrometers (page 23, lines 11-15). Grinshpun is silent as to the other cell structure parameters. However, the method taught by Grinshpun in view of Lee or Nitzsche teaches the method of claim 2 as discussed in the 103(a) rejection above. As such, the product produced by the method, is rendered *prima facie* obvious as well.

Claims 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grinshpun et al. (WO 2001/39954; published June 7, 2001) in view of Glicksman et al. (U.S. Patent 5,010,112; issued April 23, 1991).

Regarding claim 21, Grinshpun et al. teach a method of manufacturing a rigid foam (Figure 6; page 10, lines 5-30) comprising: incorporating calcium carbonate into a polymer (page 19 line 38-page 20 line 5), incorporating a blowing agent into the melt under a first pressure and a first temperature (page 20, lines 7-30), extruding the polymer melt under a second pressure and temperature to allow the polymer melt to expand and foam, and cooling the foamed product (page 21, lines 9-30) to produce a foam with a cell size ranging from 25 to 7000 micrometers (page 23, lines 11-15). Grinshpun does not specify the shape of the conventional calcium carbonate employed. However, Glicksman et al. teach an analogous method of producing rigid foam where they teach the calcium carbonate filler is acicular (col. 4, lines 12-21).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to employ the acicular shaped calcium

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carbonate filler as taught by Glicksman et al. as the calcium carbonate employed by Grinshpun for the purpose, as taught by Glicksman, of improving the insulating property of the foam (col. 1, lines 47-58). As such, the entire invention as a whole is rendered obvious over the combined teaching of the prior art.

As to claim 22, Grinshpun teaches the using nucleating agents in the polymer melt (page 19, line 38 - page 20, line 5).

As to claim 23, Grinshpun in view of Glicksman et al. produce a foam by the method of claim 21 as discussed in the 103(a) rejection above. As such, it is *prima facie* obvious that the material produced by the method of Grinshpun in view of Glicksman will have the same properties as the material produced by the instant claim.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grinshpun et al. (WO 2001/39954; published June 7, 2001) in view of Morgenstern (U.S. Patent 6,589,646; issued July 8, 2003) or Nitzsche (U.S. Patent 6,617,295; issued September 9, 2003).

Regarding claim 24, Grinshpun et al. teach a method of manufacturing a rigid foam (Figure 6; page 10, lines 5-30) comprising: incorporating nano-particle fillers or calcium carbonate into a polymer (page 19, line 38 - page 20, line 5), incorporating a blowing agent into the melt under a first pressure and a first temperature (page 20, lines 7-30), extruding the polymer melt under a second pressure and temperature to allow the polymer melt to expand and foam, and cooling the foamed product (page 21, lines 9-30) to produce a foam with a cell size ranging from 25 to 7000 micrometers (page 23, lines

11-15). Grinshpun does not explicitly teach what specific material the nano-particles/nano-fillers employed are nor does he teach the particle size of the conventional calcium carbonate employed.

However Morgenstern teaches an analogous method of employing calcium carbonate as a nucleating agent where he teaches the particle size of calcium carbonate is preferably in a range from 10 nanometers to 1000 nanometers (col. 2, lines 59-67). Additionally, Nitzsche teaches the use of calcium carbonate in the utilization of an analogous foaming resin (col. 3, line 64 – col. 4, line 7; col. 4, line 66-col. 5, line 9) and further teaches that the particle size of nucleating agents impacts the cell structure (col. 2, lines 47-49).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to employ nano-particles of calcium carbonate while practicing the method taught by Grinshpun because, as taught by Morgenstern, the particle size of calcium carbonate is intrinsically within the specified range and because Nitzsche teaches that the particle size of the nucleating agent is a result effective variable for the cell structure. As such, the particle size of the nucleating agent, in this case calcium carbonate, would have been readily optimized as is routinely practiced in the art.

Response to Arguments

Applicant's arguments with respect to claims 1-24 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

All claims are rejected.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent 6,123,881 to Miller et al. teach a pertinent process for producing foam with a cell size in the range of 10 – 400 micron similar to the method taught by Grinsphun et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Wollschlager whose telephone number is 571-272-8937. The examiner can normally be reached on Monday - Friday 7:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

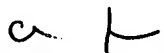
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JW

Jeff Wollschlager
Examiner
Art Unit 1732

May 31, 2006


CHRISTINA JOHNSON
PRIMARY EXAMINER
6/5/06